asthma, of a human or veterinary subject. The term "therapeutically effective amount" as used with respect to an agent means an amount of the agent which imparts a therapeutic effect to the human or veterinary subject.

[0012] Methods of Treatment

[0013] In some aspects, methods for treating sinusitis are provided. The methods include administering to the subject an effective amount of a composition that stimulates growth or activity of a genus of bacteria that is decreased relative to a control subject not having sinusitis and/or inhibiting growth or activity of a genus of bacteria that is increased relative to the control subject.

[0014] In some embodiments, the methods provided herein include administering a composition including bacteria to a subject. In some embodiments, the bacteria are from the genus *Corynebacterium* and/or the genus *Peptoniphilus*. In some embodiments, the bacteria from both the genus *Corynebacterium* and the genus *Peptoniphilus* are administered concurrently or sequentially. In some embodiments, an additional active agent is administered concurrently or sequentially with the bacteria. In embodiments, the additional active material is an antibiotic that is bacteriostatic or bactericidal to the genus *Streptoococcus* and/or the genus *Burkholderia.*

[0015] In embodiments, a composition is administered orally. In embodiments, a composition is administered nasally. In some embodiment the composition is administered with a pharmaceutically acceptable excipient. In some embodiments, the pharmaceutically acceptable excipient is suitable for nasal administration.

[0016] The exact dose and formulation will depend on the purpose of the treatment, and will be ascertainable by one skilled in the art using known techniques (see, e.g., Maynard et al., (1996) A Handbook of SOPs for Good Clinical Practice, Interpharm Press, Boca Raton, Fla.; Dent (2001) Good Laboratory and Good Clinical Practice, Urch PubL, London, UK).

[0017] Pharmaceutical Compositions

[0018] In some aspects, compositions are provided that include a bacterial composition. The bacterial composition may include bacteria from the genus *Corynebacterium* and/or the genus *Peptoniphilus*. In some embodiments, the bacteria composition includes the genus *Corynebacterium* and/or the genus *Peptoniphilus* that are obtained from the oral cavity, nasal cavity, or anterior nares of warm-blooded vertebrates (e.g., humans).

[0019] Such pharmaceutical compositions may take any physical form necessary depending on a number of factors including the desired method of administration. Such physical forms include a solid, liquid, sol, gel, aerosol, or any other physical form now known or yet to be disclosed. The concept of a pharmaceutical composition including bacteria also encompasses the bacteria without any other additive. The physical form of the composition may affect the route of administration and one skilled in the art would know to choose a route of administration that takes into consideration both the physical form of the bacteria and the desired result (e.g., colonization of the anterior nares and/or nasal cavity). Pharmaceutical compositions that include the bacteria may be prepared using methodology well known in the pharmaceutical art. A pharmaceutical composition that includes the bacteria may include a second effective compound, such as an antibiotic compound.

[0020] Pharmaceutical compositions including the bacteria may be prepared as an aerosol. Aerosols encompass a variety of systems including colloids and pressurized packages. Delivery of a composition in this form may include propulsion of a pharmaceutical composition through use of liquefied gas or other compressed gas or by a suitable pump system. Aerosols may be delivered in single phase, biphasic, or tri-phasic systems. Pharmaceutical compositions may be prepared for delivery on an absorbent material. In some embodiments, the composition may be delivered in the nasal cavity. In some embodiments, the composition may be delivered topically within the nasal cavity.

[0021] Pharmaceutical compositions that include the bacteria may also include a pharmaceutically acceptable carrier. Carriers include any substance that may be administered with the at least one probiotic organism with the intended purpose of facilitating, assisting, or helping the administration or other delivery of the active pharmaceutical agent. Carriers include any liquid, solid, semisolid, gel, aerosol or anything else that may be combined with the active pharmaceutical agent to aid in its administration. Examples include diluents, adjuvants, excipients, water, oils (including petroleum, animal, vegetable or synthetic oils.) Such carriers include particulates such as a tablet or powder, liquids such as an oral syrup or injectable liquid, and inhalable aerosols. Further examples include saline, gum acacia, gelatin, starch paste, talc, keratin, colloidal silica, and urea. Such carriers may further include binders such as ethyl cellulose, carboxymethylcellulose, microcrystalline cellulose, or gelatin; excipients such as starch, lactose or dextrins; disintegrating agents such as alginic acid, sodium alginate, Primogel, and corn starch; lubricants such as magnesium stearate or Sterotex; glidants such as colloidal silicon dioxide; sweetening agents such as sucrose or saccharin, a flavoring agent such as peppermint, methyl salicylate or orange flavoring, or coloring agents. Further examples of carriers include polyethylene glycol, cyclodextrin, oils, or any other similar liquid carrier that may be formulated into a capsule. Still further examples of carriers include sterile diluents such as water for injection, saline solution, physiological saline, Ringer's solution, isotonic sodium chloride, fixed oils such as synthetic mono or digylcerides, polyethylene glycols, glycerin, cyclodextrin, propylene glycol or other solvents; antibacterial agents such as benzyl alcohol or methyl paraben; antioxidants such as ascorbic acid or sodium bisulfite; chelating agents such as ethylenediaminetetraacetic acid; buffers such as acetates, citrates or phosphates and agents for the adjustment of tonicity such as sodium chloride or dextrose, thickening agents, lubricating agents, and coloring agents. In some embodiments of the invention, the pharmaceutically acceptable carrier can comprise a growth medium that can support the growth and/or static existence of the bacteria in the context of the pharmaceutical composition prior to administration of the pharmaceutical composition to the subject. For example, the pharmaceutical composition can comprise one or pharmaceutically acceptable carrier to provide sufficient sustenance for the bacteria that are also compatible with the desired route of administration (e.g., intranasal administration).

[0022] The pharmaceutical composition including the active pharmaceutical agent may take any of a number of formulations depending on the physicochemical form of the composition and the type of administration. Such forms include solutions, suspensions, emulsions, tablets, pills, pel-